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ABSTRACT

This paper describes a project at Indiana University initiated to develop research-based skills associated with instructional clarity in prospective secondary school teachers. The specific courses targeted for the project include an educational psychology course, a general methods course, and four special methods courses. Each course involves a field experience component. The focus of the project is on this component as the point at which skill training of the kind envisioned most appropriately fits. This research-based program of teacher education is based upon three levels of educational research that: (1) demonstrate relationships between teacher behavior and pupil outcome; (2) focus upon how teacher behavior skills can be acquired by trainees; and (3) concentrate on conditions under which teaching skills and behaviors acquired in a training setting are used in the classroom. The instructional medium chosen for the project was interactive video, where a computer and video player are combined. The first part of this paper describes institutional limitations in the project and the guidelines used for selecting relevant literature. The second section deals with the process of extrapolating a set of teaching skills from the literature. The final section presents a model for facilitating the adoption and implementation of the products emerging from the project. References are included. (JD)

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Developing Research Based Teaching Skills In Preservice Teacher Education

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As the title of this paper suggests, our goal is to describe the OERI project at Indiana University, its rationale and objectives, its accomplishments to date and some of its future tasks. At another level, however, we wish to present our argument for the various aspects of our project and invite your reactions, criticisms, and suggestions. Throughout the paper each such aspect will be addressed at a general level as it relates to the research and theory in the field and as it relates to the Indiana project, for there are issues at both levels which require resolution for our project to proceed.

The paper is divided into three parts. First, the context for the project is described, institutional limitations are specified, guidelines for selecting relevant literature are specified, and our commitments to a form of instructional technology are described and defended. The second section deals with the process of extrapolating from the literature a set of teaching skills which simultaneously meet the constraints of the technology selected and tests of practicality, validity and trainability. The third section presents a model fitted to our institutional context to facilitate the adoption and implementation of the products emerging from the project.

Context of the Study

An immediate context-defining element of the project resulted from the decision to focus on the secondary teacher training program only, grades 7-12. While this decision was based primarily upon the interests and expertise of the investigators, the effect on the relevance of much of the research was immediate and obvious. A large portion of the best research was rendered not irrelevant, but of uncertain relevance, since it was conducted at elementary level.

A second significant feature of context relates to the character of the secondary teacher education program at Indiana University. The program is distributed over at least three of the four undergraduate years and requires that some kind of field or laboratory experience accompany most of the courses. The specific courses targeted for this project are an educational psychology course, general methods course, and four special methods courses. Since each of these courses does include a field experience component, it seemed reasonable to focus on that component as the point at which skill training of the kind envisioned for the project would most appropriately fit. The implications of this decision are most obvious for the third section of this paper, adoption and implementation.

Guidelines for Selecting Related Research.

The strategy for identifying the related research involved computer searches of all likely databases. Such terms were used as teaching skills or teacher behavior coupled with such outcomes variables as pupil achievement, teacher ratings, or attitude changes. This combination of key words, plus an extensive number of variations, constituted the primary search strategy for what the project defined as Level 1 research. The concept of "levels of research" was quite important as the project proposal took the position that an effective research-based program of teacher education should be based upon three levels of educational research.

Level 1 research is that just described. It is research which demonstrates relationships between teacher behavior and some kind of pupil outcome. It is the kind of research which has been emerging over the past twenty-five years and is most often described as process-product research. Various reviewers including Borich (1979), and Good (1979) list

such teaching skills as provision of praise and feedback, monitoring of pupil behavior, and direct instruction as related to pupil learning at the elementary level. Rosenshine (1979) lists teachers' task focus, clarity of presentation, acknowledgment of pupil ideas as teacher behaviors associated with pupil achievement at the secondary level. Later reviewers such as Good and Brophy (1986) and Brophy (1986) identify time spent in active teaching as associated with student achievement. Brophy (1983) identifies a series of teacher skills or behaviors within the context of whole-class or small-group instruction. Examples include structuring, sequencing, clarity, and questioning—as significant skills related to student achievement. At the same time leading theorists such as Gage (1984), and Smith (1985) argue convincingly that the sum of process-product research provides an adequate basis for teacher education programs.

Our own search of the literature rediscovered most of the same skills as those in the published reviews. The use of two additional screens had the effect of reducing significantly the total amount of qualifying research. The first, previously mentioned, was to give priority to research at the secondary level. The second screen consisted of rating by a group of selected junior and senior high school teachers of the perceived usefulness of the skills. Application of these screens plus certain additional criteria to be described in the next section led to the identification of four skill areas given highest priority, questioning, clarity of explanation, warmth and encouragement, and teaching style.

While Level 1 research may provide the basic content for a teacher education program, the actual conduct of such a program probably depends upon another level of research which we call Level 2. This is research which focuses upon how teacher behavior skills can be acquired by

trainees. Of particular theoretical importance in developing the notion of Level 2 research is the work of Smith and others in Teachers for the Real World (1969) and the protocol materials movement of the early 1970's. This notion coupled with research undertaken by Wagner (1973) and Gliessman, Pugh and Bielat (1979) argue for and provide data in support of the power of conceptual-observational training in the development of teaching skills. In a more recent view of a literature on training methods in teacher education, Gliessman, Pugh, Dowden and Hutchins (1985) argue that it is training in the concepts of teaching through observation and interpretation that is the primary factor in change in skill levels. This is to say that skill development seems to rest more on conceptual understanding of the skill itself rather than practice with the skill, particularly practice in the absence of the understanding. In the final analysis, the Level 2 research literature for the four skill areas identified in the present project was uneven--substantial for questioning and teaching style, sparse for clarity and explanation. The general Level 2 research literature is extensive enough, however, to provide a good base for the design of instructional programs.

The final category of research is Level 3. Research at this level concentrates upon conditions under which teaching skills and behaviors acquired in a training setting are used in the classroom setting. Showers (1986) argues very cogently that teachers have been shown to have acquired through training, particularly in microteaching settings, a variety of skills from simple to complex, yet have failed to manifest these behaviors in the classroom. The amount of research conducted at this level is not great and the results are mixed; there are some positive findings (e.g., Emmer, 1971) and some negative (e.g., Peterson 1973). More recent research by such investigators as Copeland (1977, 1980), Mohlman,

Coladarci and Gage (1980) and Needels (1980) produced more complex findings regarding the conditions under which skills were in fact transferred. These findings indicate that variables present in the training setting and variables present in the transfer setting both influence the extent to which acquired skills are used. Among the former variables are the degree to which recommended skill or teaching practice is understood by the trainee, the apparent readiness with which a skill or practice can be used in the classroom, and the degree to which a skill fits the personal values of the trainee. Among the latter variables are the degree of support the trainee's cooperating teacher provides for a skill or teaching practice both through direct, personal influence and the building of an instructional environment that is receptive to that skill or practice. Showers (1986) advocates the literature on transfer of training and learning-to-learn as providing a theoretical and research base for further exploration in this area. She also mentioned such school factors as "building norms that support experimentation and organizational structures that support learning" (Showers 1986, page 13). Based on this and other related literature, a project strategy is to develop a cadre of knowledgeable and sympathetic supervising teachers who will support the practice of specific skills and behaviors during field and student teaching experience.

Interactive Video as a Means of Facilitating Skill Acquisition and Transfer

In this project, the choice of the instructional medium did not proceed in the sequence typically advocated by instructional designers. In the ideal case the choice of the medium would emerge from particular teaching behaviors or skills selected from the literature. The specific

characteristics of those skills or behaviors would in large measure determine the instructional strategy and the medium, if a medium were even needed. In this case the medium was preselected, and in fact became a constraint in the choice of skills rather than the reverse. Clearly a defense of this strategy is in order.

First, a definition is needed. Interactive video involves combining of a computer and video player, either videotape or videodisc. It assumes that an individual learner will interact with the program, although it can be employed with small or large groups as well. Several levels or forms of interactivity have been defined (Gayeski and Williams, 1980). Moving up the levels of interactivity the learner role changes from that of passive respondent to controller of the program (LeBrasseur, 1986). Likewise the computer program itself can vary in complexity as noted by LeBrasseur:

> "The computer program can gradually involve more response judging, embedded questions, remedial branching and 'intelligent' record keeping capabilities such as student response records which determines the type, amount and sequence for remediation." (LeBrassuer, 1986, p.2)

Probably the easiest defense for the choice of this medium would be a published series of convincing studies which document the effectiveness of the medium in bringing about the acquisition and transferability of teaching skills. Such studies are not yet in the literature although there is evidence of growing utilization of the medium in teacher education. The number of publications which provide data on effectiveness seems quite limited. Defense of the choice of interactive video must be on other grounds, those being partly theoretical and partly based upon our own experience using this and related media in teacher education. One kind of defense is that of practicality. It is not difficult to argue that large teacher education programs in universities located in

relatively small cities find it extremely difficult to involve students in significant observation programs. A corollary of this proposition would note the even greater difficulty of monitoring, supervising, and providing any kind of meaningful feedback on the validity of observations. This problem can be solved by interactive video, but also by other means. For example a library of systematically chosen tapes or films of classroom episodes shown in university classes will accomplish many of the objectives of classroom observation.

A more cogent defense would seem to lie in the capacity of this medium to pursue simultaneously the objectives of acquiring the conceptual bases of specific teaching skills and making strides toward skill acquisition by providing videotaped models of those demonstrating the skills. Research cited earlier relative to Level 2 research demonstrating gains in skill acquisition through conceptual-observational training tends to document the potential usefulness of interactive video as well. The effectiveness of modeling in contributing to the acquisition of modeled behaviors has been well documented by the work of Bandura in observational learning (Bandura, 1972).

The power of interactive video to locate and display in any order brief scenes illustrative of concepts basic to important teaching skills constitutes an instructional means not previously available. The fact that computer programs can be developed--analogous to typical CAI-type concept learning programs, but with examples presented in the form of live behavioral episodes, would seem to have enormous potential. At a project level, however, this potential is not easily realized. The problems of a new medium in a new area of application means, as indicated above, relatively little guidance from the literature. There are issues about equipment both in terms of producing the initial video footage and in the

varieties of computer-video player interfaces. There are problems of expertise relative to the design of the interactive video lessons, and programing the lessons into the computer. There are numerous problems relative to the optimal settings for use of the materials. A useful outcome of the project experience would be extensive documentation of the problems encountered, and the solutions attempted in relation to the medium of interactive video in teacher education.

Extrapolation of Skills

The general problem of extrapolating from the research skills to be used in training entails three subproblems: identification and selection; translation; and representation. These three problem areas will be addressed both at a general level and with reference to our own project.

Identification and selection. As an objective of training, a skill should first meet the requirement of practical significance: is that skill of central and/or general importance in teaching? Skills differ in this respect; in the skill area of questioning, for example, the use of rhetorical questions as an occasional attention-attracting device would appear to more limited in importance than the use of probing questions to pursue vaguely or inaccurately understood content. In the present project, drawing upon both the research literature and common experience, project staff and classroom teachers identified and listed an array of skill areas including questioning, explaining, encouraging and approving, group management and control, teaching style, clarity and miscellaneous particular skills. These skills and skill areas were placed in initial priority groups on the criterion of practical significance.

A second selection criterion is that a sufficient Level 1 research base exist to demonstrate a reliable relationship between a specific skill or skill area and pupil learning or other behavioral outcome. In this context, "reliability" encompasses both the statistical significance and the consistency of a relationship across process-product studies. Thus, a skill that shows a moderate positive relationship with learning outcomes through several studies would more nearly meet the criterion than would a skill demonstrating a stronger relationship but in a single study.

In a training setting, a third selection criterion ought to concern the "trainability" of a specific skill, that is its modifiability through instruction or training. Here, the Level 2 research can be relied upon for evidence. The task is to assess the presumed trainability of a selected skill against the general and specific evidence from training studies. By general evidence is meant both evidence of training effects across <u>all</u> skills and evidence of those effects for "families" of skills (e.g., language skills in teaching). By specific evidence is meant evidence of the effect of training on singular skills (e.g., higher order questioning).

The application of these three selection criteria resulted in four of the previously cited skill areas being considered for development on interactive video: questioning, clarity of explanation, warmth and encouragement, and teaching style. All were judged to be of practical significance. The Level 1 research suggested that clarity showed the most reliable relationship with pupil learning outcomes (thus agreeing with the conclusion of Rosenshine and Furst in their 1971 review of process-product studies). Level 2 evidence on the trainability of clarity as a skill is quite limited because that skill has been incorporated in only a few

training studies. Evidence on the amenability of analogous language skills to change through training is generally positive, however; this body of evidence indirectly supports the trainability of clarity in that it is primarily a language skill.

Translation. Generally speaking, it is not the task of the theoretician or researcher to state the results of his or her work in descriptive or prescriptive terms. Theoretical and empirical relationships typically are stated with generality and conditionality rather than applicability in mind. As Smith (1985) has pointed out, the practical implications of such theoretical statements and empirical findings are seldom self-evident. Rather, someone must translate or "spell out" the implications in terms of concepts that can enlighten practice and skills that can be acted upon.

Both Medley (1977) and Borich (1979) have illustrated the process of translating Level 1 research findings into descriptive or prescriptive statements about teaching behaviors. An example, adapted from Medley, of a correlation-based descriptive statement reflecting the relationship between instructional activity and gains in basic skills is "More time spent working with large groups or a whole class [is correlated with greater gains in basic skills]." An example, taken from Borich, of a prescriptive statement reflecting the finding that flexibility of rules is correlated positively with pupil achievement is to "Establish flexible rules sufficient to keep order, and change them when necessary."

While the teaching correlates exemplified above are fairly directly suggestive of actions, clarity is an abstract and frankly qualitative characteristic. In a general sense, clarity might be defined in terms of near synonyms (e.g., visibility or salience) or in terms of antonyms

(e.g., the opposite of vagueness or opaqueness). Such definitions fail to suggest, however, specific concepts or skills that might serve as the focus of training in clarity. It is more useful to identify the behavior or skill variables that have been found to discriminate between clear and unclear teachers or clear and unclear teaching.

Two investigators have used the latter approach to defining clarity: Cruickshank and his coinvestigators (Hines, Cruickshank, & Kennedy, 1985; Kennedy, Cruickshank, Bush & Myers, 1975) assessed the difference between clear and unclear teachers while Brown and Armstrong (1984) assessed the difference between good and poor lessons reflected partly in degree of clarity. Together, they have generated a list of characteristics of clarity—the identification and connecting of main or key ideas, use of examples, assessing and correcting deficiencies in comprehension, focusing, and cognitive demand—that can be translated into such parallel descriptive statements as:

a. By verbal or visual means, key ideas are designated or emphasized and explicit connections are made among or between them.

b. Verbal or visual illustrations and examples are given for key ideas.

c. Pupils are questioned on content, and their responses pursued, to assess deficiencies in understanding of content.

d. By verbal or visual means, attention is drawn to selected aspects of content upon which to focus.

e. Content is presented as challenging but comprehensible material in terms of vocabulary, ideas, implications, etc.

The above descriptive statements can be usefully organized under two general categories that appear to refer to different aspects of clarity: structural clarity and semantic clarity. Structural clarity (item a.

above) refers to the relative salience of the organizational features of content taught while semantic clarity (items b. through e.) refers to the meaning of words and concepts in continuity and context. Clarity in these two senses will serve in our own project as criteria for assessing content taught both in training videotapes and in post-training teaching.

Representation. Byrne (1983) has pointed out that a basic pedagogical problem in teaching or instruction is how subject matter is to be represented to the student. His supposition is that knowledge at a theoretical level is organized differently and stated more comprehensively than the same knowledge at the level of pedagogy. All that we have said so far about the processes of selection and translation assumes that the same may be said of skills as content derived from Level 1 research. We have contended that such skills must be stated in prescriptive or descriptive terms that sometimes may be quite different from the conditional, hypothetical terms that tend to characterize research reporting.

In addition to terminology, however, there is a second dimension to representation: the design of a representation and elements of that design. What non terminological elements are required and how are they to be related to the terminology itself? Since we are here dealing with teaching skills, the Level 2 research—that research dealing with change in teaching skills—ought to be of direct use to us. As we have seen, the research at that level tends to underline the power of conceptual-observational methods of training. Such methods typically include definitions of the skills to be acquired along with examples—printed, audio or visual—of those skills, confrontation with new examples or instances, opportunity for trainee responding with

feedback. While they have not consistently done so, researchers could well have rationalized these elements in terms of generally accepted principles of concept learning. A direct implication for the present project is that the characteristics of structural and semantic clarity ought to be instanced or exemplified through the use of videotaped protocols while trainees are given an opportunity to respond interpretively, provided with feedback on the appropriateness or accuracy of their responses, and their grasp of the characteristics of clarity assessed by being confronted with new instances or examples. All of these requirements are within the capacity of an interactive video program and should be realized in its design.

Adoption and Implementation: Some Recommendations

The problem of adoption and implementation in the present project has three aspects: (1) adoption and use of the targeted clarity skills by trainees following training, (2) adoption of the rationale supporting those skills by college instructors and cooperating teachers and (3) adoption and implementation of the interactive video program by college instructors. The empirical support for a set of recommendations to solve the first of these aspects has been presented in the discussion of Level 3 findings in the first section of this paper. Briefly, these findings suggest that an interactive video program and its accompanying instruction must (1) clearly present the characteristics of structural and semantic clarity, (2) underline the practical utility of clarity related skills and (3) provide a strong rationale for adopting clarity related skills as a central aspect of instruction. The Level 3 findings suggest also that cooperating teachers must be induced to provide a supportive classroom atmosphere for exhibition of the same skills by trainees. Means of

establishing the latter condition are implied by, or reflected in, the recommendations that are framed in the remainder of this section.

The problem of adoption and implementation of interactive video and its rationale as a training innovation requires a more extended analysis. We will describe the characteristics of the innovation, the characteristics of the users (university and public school faculties) as well as the characteristics of the organizational settings found in the School of Education and the local schools. Drawing on these descriptions of the current project in combination with research-based principles of implementation, we will identify a tentative set of strategies for implementation.

The project goal is to develop research-based skills associated with instructional clarity in prospective teachers. This goal requires that both university and public school faculties provide future teachers with appropriate instruction and support to result in the acquisition of these skills. Specifically, university faculty and associate instructors responsible for instruction in such required courses as Educational Psychology, General Methods, and Special Methods need training focused on instructional clarity. Optimally, these faculty members should be able to design course instruction that targets instructional clarity, engage their students in the use of the interactive video unit on instructional clarity, involve students in debriefing sessions following use of the interactive video units and design student field experience assignments that require the use of instructional clarity skills in classroom settings. Further, cooperating faculty in the public schools will need sufficient training in instructional clarity to support prospective teachers in their classroom efforts.

At issue is not merely the provision of training for these two faculty groups but, their willingness to participate with the kind of interest and enthusiasm that will sustain this program over time.

The following chart outlines the student program sequentially.

Semester 1	Semester 2	Semester 3	Semester 4
Educational Psychology by University Faculty & Associate Instructors	General Methods by University Faculty & Associate Instructors	Special Methods (math, science, social studies, or English) by University Faculty & Associate Instructors	STUDENT TEACHING
Accompanying Field Experience	Accompanying Field Experience	Accompanying Field Experience	
Cooperating School Faculty	Cooperating School Faculty	Cooperating School Faculty	

In the following discussion, university and school faculties as well as their supervisors are identified as the users of the implementation since their participation is critical to skill development in prospective teachers.

Characteristics of the Innovation

Glaser (Glaser, Abelson, & Garrison, 1983) postulated several attributes of an innovation that can facilitate its implementation. The following statements present a brief analysis of this project as compared with Glaser's attributes.

1. Credibility is an attribute which stems from the soundness of evidence supporting the innovation or its espousal by highly respected persons or institutions: The current innovation is research-based.

The need for research-based teacher education programs is regularly advocated in the current literature on teaching and teacher education.

2. Observability is the opportunity for potential users to see a demonstration or its results in operational practice. This innovation has a highly observable quality—the interactive video unit. However, the teaching sequence accompanying the unit is not as easily observable, nor is it feasible to visually demonstrate how a student moves through this process and acquires the targeted skills.

3. Relevance. The innovation addresses a persistent problem, the successful acquisition of teaching skills, which is bothersome to a large number of people. While the innovation is relevant in terms of research literature and the views of the developers, not all faculty necessarily attach the same importance to its use.

4. Relative Advantage. The innovation should have distinct advantages over current practices. Users can easily see that this is an improvement that will more than offset the considerable effort that change will require. Research indicates this innovation is clearly superior to conventional teaching methods in terms of acquisition of teaching skills. Namely, it is explicitly supported by research that emphasizes the positive relationship between instructional clarity and student achievement as well as research that underscores acquisition of conceptual understanding of teaching skills prior to classroom trials. However, it alters faculty roles and responsibilities.

5. Ease in understanding and installation. In terms of ease of understanding and installation, the following characteristics are relevant.

a). Interactive video units can be easily observed and understood.

b). Students will use the unit outside of class, and the bulk of the instruction is carried by the interactive video unit.

c). However, preceding instruction and follow-up activities are not readily available or packaged. Their installation places greater demands on both university and school faculty.

6. Compatibility with potential user's established values, norms, procedures and facilities. The School of Education faculty has made very limited use of technology for instructional purposes. Its use may displace some conventional instructional practices. Furthermore, some specialized training is needed. However, some faculty are receptive to its use. Finally, sufficient equipment and adequate facilities are conditions that still need to be fully realized.

7. Triability, divisibility or reversibility permit a pilot tryout of the innovation one step at a time and does not call for irreversible commitment by the system. The innovation can be piloted on a limited basis (divisibility) permitting trial in advance of commitment to its use or widespread implementation (reversibility).

Characteristics of the Organization

Glaser (1983) also addresses several dimensions of organizational climate that are especially relevant to this innovation and its settings. Each of these dimensions of organizational climate is applied to the current project in terms of both the School of Education and public school.

Distribution of Power	School of Education	Public Schools
Bureaucratic organizations are generally resistant to change, (Thompson, 1969) they stress conformity not creativity, and are conservative in orientation.	Like most institutions, the bureaucratic structure of the School of Education is normally resistant to change. However, at the present time, the administration is supportive of reform in teacher education.	Public schools share similar qualities in terms of resistance to change. However, the schools are under pressure to improve teacher productivity.

Organizational Inertia		
May be related to the age (rather than the size) of the organization and its failure to encourage self-renewal so that procedures activities and attitudes become routine and habitual (Glaser, 1968; Havelock 1969).	The current teacher education program has been in place for a decade and to some extent faculty behavior is routinized. Furthermore, the faculty is middle aged. However, selected faculty demonstrate consistent interest in research-based teacher education.	Teachers in the local schools have had a long history of serving as cooperating teachers though they have until recently been unrewarded. However, the role of the cooperative teacher in this case is a more active demanding one.
Organizational Communication and Decision Making	School of Education	Public Schools
Free communication both formal and informal flowing up and down hierarchical lines and horizontally among colleagues is conducive to successful innovations (Miles 1965; Marcum 1968; Glaser, 1973).	Communication is quite hierarchical (dean -> associate deans -> department heads -> faculty & staff). Communication across faculty involved in this innovation is somewhat limited by departmental structure. (Educational Psychology faculty are in a department separate from the rest). Communication appears to be more fluid within rather than between departments. At the same time communication among faculty is frequent. However, it is less frequent between faculty and administration.	Communication is also quite hierarchical (superintendent -> principal ->teachers). Communication between faculty is relatively open. Informal contacts between university and school faculty are frequent.

Administrative & Colleague Support		
Administrative rewards that motivate problem-solving efforts should exist. (Costello and Zalkind, 1963). The administrator should serve as an reinforcement agent.	Administrative rewards are largely related to promotion, tenure, and salary decisions. Some problem-solving efforts are recognized in this way. Little occurs in the way of personal, one-on-one reinforcement. Publicity is occasionally used as a means of recognition and reward.	Administrative rewards vary from school to school. Annual raise determined by salary schedules. One-on-one reinforcement depends on the specific principal in each of the schools. Publicity is occasionally as a means of recognition and reward.
Collegial support in adoption efforts positively influences adoption (Lippitt, et. al., 1967).	Several university faculty who have participated from the onset of this project may serve as opinion leaders (Jwaideh & Marker, 1973). Some evidence of faculty collaboration exists.	Some public school teachers who have already participated in this project may serve as opinion leaders and facilitate the involvement of cooperative teachers.
Participation in Decision-Making	School of Education	Public Schools
Extensive participation by all persons concerned is conducive to change (Glaser, 1976, 1981).		Some, but not all faculty who will be needed, have participated it the project decision-making from the outset. Administration and faculty also participate in some collective decision-making in both settings.

Characteristics of Users

The characteristics of both university and school faculty and their respective supervisors deserve full consideration as implementation strategies are designed. The following categories were drawn from Glaser (1983) who derived them from existing research.

Glaser	University	School
Age, Tenure and Vested Interest		
Age. Research is mixed regarding the relationship between age and responsiveness to innovations. Middle age groups seem to be most tradition-minded (Lippitt et. al., 1967).		The faculty of both institutions involved in pilot implementation tend to fall in the middle and older age ranges.
Tenure		
Tenured faculty are more resistant to change.		Virtually all relevant university and public school faculty are tenured.
Turnover		
Turnover at the lower levels of the organization (rather than administrative turnover) has a negative effect on diffusion of innovation.		Both faculties demonstrate very little turnover.
Strong Vested Interests		
A tendency to preserve the status quo can serve as a powerful barrier to the introduction of change (Watson & Glaser, 1965).		While the existence of strong vested interests in both university and school settings is undocumented for this project, it is likely that some faculty members will perceive this change as a threat to their ongoing procedures.
Professional Qualities & Social Contacts		
Opinion leaders are found among well-respected faculty.		Among university and school faculty there are a few faculty members who can serve this function
Feelings of security are fundamental to accepting innovation (La Piere, 1965; Berlin, 1969).		Some, not all faculty, in both groups are sufficiently secure not to perceive this innovation as threatening. However, others may see the innovation as one that threatens their conventional procedures.

Professional Qualities & Social Contacts	University	School
Cosmopoliteness		
Contacts with other professionals other institutions (professional meetings, journals) contribute to the likelihood of innovative behavior (Katz, 1961; Rogers, 1962).	These conditions exist for some, though not all, faculty in both faculty groups.	
Psychological Attributes		
Staff Morale & Cohesiveness		
High staff morale is related to organizational innovativeness (Chesler & Fox, 1967; Glaser & Ross, 1971).	It is estimated that both faculty groups are characterized by a middle, or middle to to low level of staff morale. The conditions contributing to this condition are, to a large extent, outside the control of project staff.	
Group cohesiveness may or may not support norms for innovation.	Key faculty in each group are supportive of the innovation. Their participation as opinion leaders may influence others.	
Physical and social distance between members and subunits and the sources of innovation may impede change (Rogers, 1962; Havelock, 1969).	In the university setting most of the faculty involved are in moderately frequent contact with the source of innovation and with each other.	In the school setting, faculty will be distributed across several school buildings and departments. They will be further removed from the source of innovation than university faculty.
People who are innovative are relatively non-defensive, not afraid of failure and oriented to personal and professional growth.	Some faculty in each group can be so described.	

Recommendations for Implementation

From the categories used above, some are especially salient suggesting needed strategies for implementation.

1. A credible innovation is one that has currency in the literature and is grounded in evidence or research. The current innovation measures up to this standard. To enhance credibility, it will be useful to develop a brief research report for both faculties that summarizes related research, identifies key research advocates and draws implications for the preparation of teachers.

2. The interactive video unit is, in considerable measure, highly observable. However, accompanying and follow-up instruction and supervision are needed. These functions are more ambiguous and not as observable. Given these conditions, an Instructor's Guide to Instructional Clarity will be developed for use by both school and university faculty. It will support the work of both faculties in their respective classrooms. This guide will heighten the observability of the instructional and supervisory aspects of the innovation.

3. The relevance of research-based instructional skills is not salient to all faculty members. To heighten awareness and demonstrate relevance, observability, credibility and relative advantage to reluctant users, a videotape that focuses on the entire process will be considered. Such a videotape would present a student going through the full instructional sequence and field experiences associated with developing competence in instructional clarity skills. This videotape could serve to demonstrate the effectiveness of this innovation.

4. To increase compatibility with the user's values, norms and procedures, it is planned that the users will be involved in a conference that highlights innovative uses of technology in teacher education nationally. It is hoped that this conference will strengthen faculty interest and involvement with this innovation.

5. This project has completed an initial trial of interactive video units in Educational Psychology classes. In the fall, it will conduct another pilot trial using the new interactive video unit. Faculty will have the opportunity to observe this trial and review reports of its effectiveness. Further, faculty will be involved in analysis and decision-making related to wider implementation. Thus, implementation takes place one step at a time and does not call for irreversible commitment. These conditions respond in some measure to triability, divisibility, and reversibility as specified by Glaser (1983).

6. The fact that schools and universities are both concerned with heightening teacher productivity suggests that occasions should be created for administrators in both settings to become conversant with this innovation and the conditions it requires for implementation. However resistant to innovation these bureaucratic settings may be, increasing the awareness of key administrators can be helpful.

7. Administrative rewards vary in each setting. Of special importance in the university setting is the annual salary review. If agreement could be secured by department heads, as well as school-wide administration, to fully recognize faculty participation in this innovation, this condition would minimize the chances of rejection. Further, recognition is a potent form of reward. A letter from the dean to the faculty member's department head (with a copy to the faculty member) can be a potent reward for some, if not most, faculty. Actions of this sort reflect one kind of one-on-one communication between the dean and individual faculty members.

Furthermore, administrators in both settings can make use of both internal publicity (newsletters) and external publicity (local newspapers)

to provide for faculty recognition. Further, personal statements on a one-on-one basis from administration to faculty can also be useful. In short, the project staff seek to engage relevant administrators in discussions that highlight the need for reward mechanisms in order to facilitate project implementation.

Finally, the university's relationship with cooperating teachers is likely be strengthened if it implements the following strategies: a) provides clinical associate status, b) sends letters of recognition to public school administrators, c) affords publicity in its own communication organs, and d) invites them to special conferences and events at the university.

8. The project needs to provide occasions for faculty decision-making. The trial phase provides the most salient opportunity. Periodic meetings of relevant faculty are needed to engage in analysis and decision-making regarding implementation.

9. Opinion leaders can play an important role in aiding any innovation. This project has already identified a few members of the school and university faculties who can serve in such roles. Additional opinion leaders need to be identified.

10. Both school and university faculty members will require training to support their skillful participation. Such training efforts need to be designed with the participation of both groups. Furthermore, the training needs to involve a substantial block of time. Implementing such a training effort requires administrative support in both institutions as well as released time for faculty in some instances.

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